COMPOSITION AND PROCESS FOR CLEANING AND DISINFECTING FOOD PRODUCTS

Field of the Invention

The instant invention relates to a composition and process for cleaning and disinfecting food products, such as a fish or other seafood products. The composition and process is also useful for meat products, including hamburger beef, sausage, hot dogs and poultry. In particular, it relates to exposing the product to the composition, such as by grinding ice blends, smokehouse rinse cycles, steam skinning, topical application by spraying the product or immersing the product in a treatment bath of lemon juice, lime juice, salt, vinegar, turmeric powder and water for killing bacteria and loosening scaly or rough surfaces, while maintaining a pleasant organoleptic taste for the consumer of the product. The composition and process cleans a product, such as a scaled fish of oily film and tissues while at the same time maintaining the taste and textural consistency of the fish or other meat product. Furthermore, the composition and process can be used to sanitize food preparation surfaces and equipment in restaurant and home kitchens. In agriculture, the composition and process can be used for a feed spray to sanitize livestock feed materials and can be used as a livestock wash for the eyes and mouth of livestock, such as cattle or sheep.

Background of the Related Art

The past few years have been especially tough on the food industry. Recalls have damaged many brands and entire companies and put in question the public's confidence in the wholesomeness of foods in general. Since the tragedy of September 11, 2001, there is a heightened alert for the dangers of contaminated food. Product recalls may have a catastrophic effect like never before. Since September 11, 2001, the public react differently to the dangers of food contamination and the media is on heightened alert. The risk factors for a food related industry with such an event has gone from possible costly product recalls to certain economic devastation.

Although several substances are known in the art for treating and scaling the surfaces of different fish, removing such surfaces of scales and oil subcutaneous films, no commercial composition or process is known or suggested which permits the cleaning and disinfecting of a fish without causing the treated fish to shrivel up and assume a "pickled" texture, while a disinfecting of bacteria from the fish. For example, in U.S. Patent 3,706,333 to Ammerman, a process is described for cleaning fish in a caustic bath, and in U.S. Patent 4,951,155 to Pack a process is described for descaling fish by immersing the fish in an aqueous bath of vinegar and water. Such processes, however, unlike the present composition and process, damage the

inherent textural consistency of the fish fillet meat, and leave an acidic odor.

Other prior art patents include U.S. Patent No. 4,944,957 of Kingsley and 2,383,907 of Beechem, as well as United Kingdom Patent No. 18,345 of Danilevsky. Kingsley concerns use of citric acid for odor treatment and Danilevsky uses acetic acid to preserve fish. Beechem claims to describe acids to kill bacteria, but cites as an example 10% nitric acid to clean hard shelled beans.

Objects of the Invention

It is therefore an object of the present invention to clean and disinfect edible food products, such as fish or meat, while maintaining a pleasant organoleptic taste for the consumer of the product.

Summary of the Invention

In accordance with the present invention there is provided an aqueous composition which is suitable for treating by immersion a meat product, such as an uncooked fish therein, whether fresh or thawed from a frozen state, to remove a variety of undesirable filmy substances and subcutaneous debris while retaining a fresh odor to the fish for cooking and maintaining

the textural consistency and appearance of the fish fillet materials.

The composition and process may also be used on meats, such as pork, beef or poultry, or other types of seafood, such as lobster, shrimp and shellfish, whether fresh or thawed from a frozen state.

Among the materials used in the composition of the invention in which the food product may be immersed, the following may be mentioned, without implying any limitation, namely, water, 5% white vinegar solution (acetic acid), lemon juice, lime juice, salt and turmeric.

For example, oily films and subcutaneous debris on the surface of a fish may be easily cleaned by treatment with the composition of the invention since, as the fish is immersed for a period of time, generally 5-7 minutes, these undesirable substances are removed in the aqueous solution, thus avoiding in consequence the final step of cleaning these substances with knives. It is to be understood that the treatment composition of the invention may be applied to previously scaled fish fillets. The composition thus obtains a clean fish fillet which is also highly disinfected of bacteria, thus increasing its desirability for cooking.

A laboratory conducted a bacterial analysis and count on raw fresh fish prepared and treated in the manner of the present

invention both before and after the application of the fish cleaning bath confirms the bacterial disinfecting efficacy of the composition and process of the present invention. It is also found that the treatment composition and process of the invention inhibits and/or reduces growth of bacterial infection on raw foods such as beef, pork, fowl, and the like.

The composition and process cleans and disinfects food products, such as a fish or other seafood products. The composition and process is also useful for meat products, including hamburger beef, sausage, hot dogs and poultry. In particular, it relates to exposing the product to the composition, such as by grinding ice blends, smokehouse rinse cycles, steam skinning, topical application by spraying the product or immersing the product in a treatment bath of lemon juice, lime juice, salt, vinegar, turmeric powder and water for killing bacteria and loosening scaly or rough surfaces, while maintaining a pleasant organoleptic taste for the consumer of the product. The composition and process cleans a product, such as a scaled fish of oily film and tissues while at the same time maintaining the taste and textural consistency of the fish or other meat product. Furthermore, the composition and process can be used to sanitize food preparation surfaces and equipment in restaurant and home kitchens. In agriculture, the composition and process can be used for a feed spray to sanitize livestock

feed materials and can be used as a livestock wash for an orifice, such as the eyes and mouth of livestock, such as cattle or sheep. Moreover, the composition can be applied to displayed produce, by spraying or surface rinse for freshness and extended shelf life.

The composition and process of the present invention removes subcutaneous slime and odor from fresh fish or meat in preparation for cooking, and further, disinfects the fish or meat to be cooked in the event that harmful bacterial or other microorganisms reside on the raw fish or meat. Such harmful microorganism may be a residue of polluted water from which the fish was taken, or may have originated from filthy food preparation facilities of either fish or meat products.

Raw fresh fish normally has an odor which can be removed by the use of the fish cleaning composition of the invention. Such fish odors emanate from the proteins and oils inherent in raw fresh fish. The combined lemon juice and lime juice of the resent composition, together with the 5% vinegar solution and turmeric have a unique ability to remove the normal "fishy" odor of raw fresh fish, and replace that odor with a slight citrus odor which masks an acidic, vinegary odor which emanates if just vinegar is used as in Pack '355. The slight citrus odor is the result of combined lemon and lime scents from the natural fruit

juices used in the invention. This citrus odor adds to the flavor and appeal of the fish both before and after cooking.

The fish cleaning bath also has the effect of removing the natural slime coating inherently found in or upon most raw fresh fish after descaling. The result of using the fish cleaning bath of the invention on raw fish is that after such treatment, the fish has a non-slippery feel, and is thus fare more appealing to a consumer who purchases and prepares the fish for consumption.

The present invention further kills or removes pathogenic bacteria which may be upon the surface of raw fresh fish before cooking. Such bacteria may originate in polluted water from which the fish was taken, or from unclean food preparation surfaces with which the raw fish comes in contact during preparation for cooking.

This disinfecting aspect of the present invention is confirmed in laboratory testing.

Description of the Preferred Embodiment

The present invention is both a treatment composition, which is a combination of ingredients, and a process, which is the cleaning, de-sliming, disinfection and deodorizing of raw fish to be cooked by using the treatment composition of the invention in a fish cleaning bath.

Alternatively, the treatment composition and process may be used for other raw meat products, such as beef, pork, poultry and other types of seafood, such as crustaceans and shellfish.

A typical preferred embodiment of the treatment composition contains the following proportion of ingredients:

Water 0.5 Gallons	64 fluid ounces	50%
5% White Vinegar Solution	10 fluid ounces	8%
Lemon Juice	27 fluid ounces	21%
Lime Juice	27 fluid ounces	21%
Total Liquid Volume per batch		
1.0 Gallon	128 fluid ounces	100%

Admixed in the above Mixture are the following solid ingredients in the following preferable amounts:

3 Teaspoons	Table Salt
3 Teaspoons	Tumeric

The fish cleaning bath is used in the following manner. First, a raw fresh fish is cleaned and eviscerated and its scales, if any, are removed by hand or by machine. The raw fish is then immersed in the fish cleaning bath for 4-8 minutes, preferably 5-7 minutes, depending on the acid concentration of the treatment composition. If exceeding 7 to 10 minutes immersion at the above identified concentration, the fish

cleaning bath may begin to decompose the flesh of the raw fish, giving an unacceptable result in which the fish flesh breaks apart easily, which is what was observed when fish were immersed in the Pack '355 solution of vinegar and water.

After the raw fresh fish has been immersed for 4-8 minutes, preferably 5-7 minutes, the fish cleaning bath, with the raw fresh fish therein, is vigorously agitated, either mechanically or by hand for 30-45 seconds. Agitation mechanically removes gross filth or soil which may be lodged upon the surface of the raw fish. When the vigorous agitation is complete, the raw fresh fish is removed from the fish cleaning bath and is thoroughly rinsed in cold water, after which the fish is ready for further preparation or for immediate cooking. The total time in which the fish is immersed in the bath is 4-8 minutes, preferably 5-7 minutes soaking time and an additional 30-4 seconds during which there is vigorous mechanical agitation. When the aforementioned concentrations are used, the raw fresh fish should not be exposed to the fish cleaning bath for more than 8 minutes. However, if lower concentrations of the components are used, then the immersion time may be 12 minutes.

After being rinsed, the fish flesh is firm, has either no odor at all or a slight citrus odor, has no slippery feel, and is substantially free from pathogenic bacteria which originated

either in the water from which the fish was taken or from unclean food preparation surfaces.

Therefore, the present invention is a combination of ingredients and proportions thereof comprising a treatment composition and treatment process for preparing raw fresh fish for cooking. Before the composition of the present invention is used, the raw fresh fish is scaled and cleaned in a conventional manner. Such conventional cleaning involves eviscerating the fish, optionally removing the head, and removing any scales by conventional means.

The treatment of the present invention is intended to clean, deodorize, and disinfect the raw fresh fish after conventional cleaning and before cooking.

The solid ingredients admixed with the above mixture may be varied as follows:

Amount:	Preferably:	Ingredient:
1-5 teaspoons	5 tsp/gallon	Table Salt
1-5 teaspoons	2 tsp/gallon	Tumeric

The above composition may be used in accordance with the practice of the invention with a time, but immersion time is shorter, up to 6 minutes maximum.

The original composition may be also used in the treatment process with a time variation but immersion time is shorter, such as up to 4 minutes maximum.

In alternate embodiments of the aforementioned preferred composition, the following variants of proportional ingredients are presented as also being suitable.

The proportions of ingredients in the composition may be varied as noted below designated as Variant 1, wherein somewhat less water is used with an increased amount of vinegar.

Water	40 fluid ounces	31%
5% White Vinegar Solution	34 fluid ounces	27%
Lemon Juice	27 fluid ounces	27%
Lime Juice	27 fluid ounces	21%
Total Liquid Volume per batch		
1.0 Gallon	128 fluid ounces	100%

Admixed in the above Mixture are the following solid ingredients:

1-5 teaspoons per gallon	Table Salt
1-5 teaspoons per gallon	Tumeric

The immersion time suitable for use in the treatment process hereinabove described is substantially the same as previously reported, i.e. from about 4 minutes to 8 minutes maximum immersion plus the time for vigorous agitation.

Another variation of the composition, including more water, a lower concentration of vinegar wherein the immersion time remains 8 minutes maximum is summarized below.

Water	69 fluid ounces	54%
5% White Vinegar Solution	5 fluid ounces	4%
Lemon Juice	27 fluid ounces	21%
Lime Juice	27 fluid ounces	21%
Total Liquid Volume per batch		
1.0 Gallon	128 fluid ounces	100%

Admixed in the above Mixture are the following solid ingredients:

1-5 teaspoons per gallon	Table Salt
1-5 teaspoons per gallon	Tumeric

Preferably, the solid ingredients are in the following amounts:

3 teaspoons per gallon	Table Salt
3 teaspoons per gallon	Tumeric

The immersion time suitable for use in the treatment process with the above composition is substantially the same, i.e. from about 4 minutes to 9 minutes maximum immersion plus the time for vigorous agitation.

In another variant, as summarized below, there is less water, same vinegar, more citrus juice and the immersion time remains 8 minutes maximum.

Water	40 fluid ounces	32%
5% White Vinegar Solution	10 fluid ounces	8%
Lemon Juice	39 fluid ounces	30%
Lime Juice	39 fluid ounces	30%
Total Liquid Volume per batch		
1.0 Gallon	128 fluid ounces	100%

Admixed in the above Mixture are the following solid ingredients:

1-5 teaspoons per gallon	Table Salt
1-5 teaspoons per gallon	Tumeric

Preferably, the solid ingredients are in the following amounts:

3 teaspoons per gallon	Table Salt
3 teaspoons per gallon	Tumeric

Suitable immersion times with this variant of the composition of the invention is similar to that used with the previously reported compositions, i.e. from about 4 minutes to 8 minutes maximum immersion plus the time for vigorous agitation.

In a further variation, designated as composition Variant 4, the composition is prepared with more water, same vinegar, with less citrus and the immersion time remains 8 minutes maximum.

Water	84 fluid ounces	32%
5% White Vinegar Solution	10 fluid ounces	8%
Lemon Juice	17 fluid ounces	30%
Lime Juice	17 fluid ounces	30%
Total Liquid Volume per batch		
1.0 Gallon	128 fluid ounces	100%

Admixed in the above Mixture are the following solid ingredients:

1-5 teaspoons per gallon	Table Salt
1-5 teaspoons per gallon	Tumeric

Preferably, the solid ingredients are in the following amounts:

3 teaspoons per gallon	Table Salt
3 teaspoons per gallon	Tumeric

In a still further variation, there is a change in lemon juice/lime juice proportions. Water, vinegar are the same as in composition Variants 1-4 above, but the immersion time remains 8 minutes maximum.

To summarize, the ingredient ranges of the original composition and variations 1-4, there is provided the following desirable ranges:

Water	40 - 84 fluid ounces	32 - 66%
5% White Vinegar Solution	5 - 34 fluid ounces	4 - 27%
Lemon Juice	17-39 fluid ounces	14 - 31%
Lime Juice	17-39 fluid ounces	14 - 31%
Total Liquid Volume per batch		
1.0 Gallon	128 fluid ounces	100%

Admixed in the above Mixture are the following solid ingredients:

1-5 teaspoons per gallon	Table Salt
1-5 teaspoons per gallon	Tumeric

Lemon Juice : Lime Juice ratio is 2:1

Another embodiment of the composition of the present invention is according to the following formula:

Ingredient	amt/1000 ml SS	amt/gal SS	amt/gal 8 fold Conc
Lemon juice (1+7)	26.4 ml	100.0 ml	800.0
Lime juice (1+6.5)	26.4 ml	100.0 ml	800.0
White Vinegar, 15%	26.4 ml	100.0 ml	266.7
Salt	4.0 gm	15 gm	120.0
Tumeric	2.6 ml	10 ml	
			1718.3
Total	1000.0 ml	3785.0 ml	3785.0

Note: SS = Single Strength - use as is
8-fold concentrate - use at 1 part concentrate plus 7 parts water

Tumeric Extract is from Heavenly Flavors of Suffern, NY.

According to the above formula, lemon juice concentrate can be used, as long as it is mixed with seven parts water. The same is true with lime juice concentrate, as long as it is mixed with 6.5 parts water.

In this formula, the preferred concentration of both lemon and lime juice, each including lemon or lime juice concentrate

and water as noted above, is about 20 percent each for lemon and lime juice, and the percentage of vinegar is about 7 percent.

In other applications in addition for fish preparation, the present invention is useful in applications such as ice blend exposures for hamburger and other chopped or ground meat in grinding machines, where the chopped or ground meat is exposed to ice. In the present invention, the composition can be frozen and mixed with the ice blend contacting the meat being ground.

The composition can also be used for preparing sausage in the sausage cooking / rinse cycle of a meat smokehouse.

In preparation of tubular frankfurter hot dogs, the composition can be applied in the steam-exposed skinning and skin removal phases of the production of the tubular product at 160 degree F, where the skin is blown off of the tubular meat product.

The product can also be topically applied to fresh meat, processed meat, chicken and seafood by brushing, spraying or rinsing.

The composition can also be sprayed or brushed upon food preparation equipment in restaurants or home kitchens, such as meat slicers, and food preparation surfaces, such as wooden or plastic cutting boards, for sanitation thereof.

For displayed produce, the composition can be applied by spraying or surface rinse for freshness and extended shelf life.

In agriculture, the composition and process can be used for a feed spray to sanitize livestock feed materials and can be used as a livestock wash for the eyes and mouth of livestock, such as cattle or sheep.

The suggested usage rate for Composition of the present invention is as follows:

a) For cut red meats (beef, pork, lamb):

For the average size piece in weight range up to 6 ounces - 1 ounce (2tbsp).

For the larger size pieces use 1 ounce for every 4 ounces.

b) For chicken

For every 1/2 pound use 1 ½ ounce (3 TBSP).

The composition of the present invention should be applied to the outside surface of the meat, except for hamburger or ground meats where it is applied in an ice blend contacting the granules of meat being ground.

For non-ground meat, such as steaks, fillets, breasts, etc., it should be worked into the surface with a moderately stiff brush making sure that the surface has been completely covered. It should be left in place a minimum of 5 minutes before being rinsed off.

Testing Examples

The evaluation of disinfecting characteristics of the composition and treatment process of the invention is illustrated by the following specific examples which are provided herein for purposes of illustration only and are not intended to limit the scope therein.

The following tests of a combination of ingredients and proportions thereof comprising a treatment composition and a process for preparing raw fresh fish for cooking were conducted under laboratory conditions. Before the treatment composition of the present invention is used, samples of raw fresh fish are cleaned in a conventional manner. Such cleaning involves eviscerating the fish, optionally removing the head, and removing any scales by conventional means. The treatment composition of the present invention is intended to be used in accordance with the practice of the invention to clean, deodorize, and disinfect the raw fresh fish after conventional cleaning and before cooking.

The objects of the present invention are to remove slime and odor from fresh fish in preparation for cooking, and further, to disinfect the fish to be cooked in the event that harmful bacteria or other microorganisms reside on the raw fish. Such harmful microorganisms may be a residue of polluted water

from which the fish is taken, or may have originated from filthy food preparation facilities.

Example 1

In order to demonstrate that the treatment composition and process of the invention kills or removes pathogenic bacteria which may be upon the surface of raw fresh fish, laboratory testing is conducted. The following is a report of the procedures, tests and results. A bacteria count on raw fresh fish is conducted by means of standard plate counts.

Six different kinds of fresh fish are purchased at a fish market. Cutting utensils and cutting surfaces are cleaned, and each of the six kinds of fish are cut into two pieces, with one piece of each kind of fish being placed in a clean sample bag without any treatment. The other piece of each of the six kinds of fish (the test sample) is immersed in a treatment bath containing the following ingredients and proportions thereof:

Water	64 fluid ounces	
5% White Vinegar Solution	10 fluid ounces	
Lemon Juice	27 fluid ounces	
Lime Juice	27 fluid ounces	
Total Liquid Volume per batch		
1.0 Gallon	128 fluid ounces	100%

Admixed in the above Mixture are the following solid ingredients:

3 teaspoons per gallon	Table Salt
3 teaspoons per gallon	Tumeric

Each test sample of fish is immersed in the treatment bath for 5 minutes and vigorously agitated for 30 seconds after which the sample is washed in cold water.

After this five-minute immersion and washing, each of the six test samples was separately placed into a clean plastic sample bag. There were thus 12 samples taken to the laboratory - control (untreated) pieces of fish and 6 experimental (treated) pieces of fish, all raw, and all purchased approximately 15 minutes before the preparation of the samples.

The control and experimental samples were transported to the laboratory immediately after the samples were prepared, and were ready for testing and one half hours after having been purchased at a fish market.

The fish samples comprised the following different kinds of fish:

	Control Sample (No Treatment)	Test Sample (5 Minute Immersion in the inventive composition)
1.	Red Snapper	7. Red Snapper
2.	Blue Fish	8. Blue Fish
3.	Whiting	9. Whiting
4.	Grouper	10. Grouper
5.	Salmon	11. Salmon
6.	Scrod	12. Scrod

Samples 1 and 7, are prepared by cutting a single Red Snapper into two equivalent-sized pieces. One being the control (Sample 1) and the other being the experiment (Sample 7). In this manner, whatever bacteria may have been present upon the purchased sample of Red Snapper is determined because the control sample was submitted to the laboratory without treatment. The only difference between sample 1 and sample 7 was the treatment given to sample 7 as described above. Thus, the effects of bacteria reduction can only be attributed to treatment with the present invention. The remaining samples are prepared in an identical fashion.

A Standard Plate Count procedure is used to determine the presence of bacteria upon each of the samples. The results obtained are summarized below:

The bacteria count showed a dramatic decrease for 5 of the 6 fish samples treated with the composition of the present invention. In one of the fish samples there was a significant decrease in the bacteria count of the treated fish sample, but the decrease was not dramatic.

Specifically, the results from the standard bacteria plate counts reported by Ameritech Laboratories were as follows:

TABLE 1 RESULTS

Control Sample [No treatment]	Bacteria Per Gram	Test Sample [5 Min Immersion] in Present Invention	Bacteria Per Gram
1. Red Snapper	2480	7. Red Snapper	496
2. Blue Fish	12400	8. Blue Fish	11160
3. Whiting	8060	9. Whiting	1550
4. Grouper	89280	10. Grouper	49600
5. Salmon	161200	11. Salmon	7440
6. Scrod	86800	12. Scrod	6200

Example 2

This example illustrates disinfecting raw fresh food products using the composition and process of the present invention.

A treatment composition prepared with the proportion of ingredients described in Example 1 is used in this Example.

The pH of Example 2 is determined to be 2.58.

Samples of five different food products (meat, fish and fowl) are purchased. Cutting utensils and surfaces are cleaned, and each of the four kinds of food (ground beef, sliced steak, pork and chicken) are cut into two pieces, with one piece of each type of food products being placed in a clean sample bag without any treatment. The other piece of each of five kinds of sample food precuts is immersed in a treatment bath (prepared as described in Example 1) using the treatment procedure described in Example 1 (5 minute immersion including 30 second vigorous agitation). Each of the test samples are washed in water and separately placed in clean plastic sample bags.

The control and experimental samples of food products are transported for laboratory testing which started within 2 hours after purchase of the food products, a Standard Plate Count bacteria analysis presence of bacteria.

The results were as follows for standard plate count of bacteria:

TABLE 2 RESULTS

Examination of:	Untreated	Treated	Percent Reduction
Hamburger	3348000	7300	99.78
Sliced Steak	744000	2600	99.65
Pork	4464000	12000	99.73
Chicken	6820000	13100	98.92
Fish	2790000	30000	98.92

Example 3

As shown in Table 3 herein, a test was conducted at Ameritech Laboratories in College Point, NY to test the efficacy of the composition and process of the present invention in treating hot dog frankfurters.

The purpose of this study was to determine the effectiveness of the composition of the present invention as an agent to control the growth of microorganisms on packaged hotdogs.

Locally purchased hotdogs were used for this study. All test items were examined for freshness. Immediately prior to application of the bacterial culture, each hotdog was immersed in boiling water for 10 seconds followed by cooling for a minimum of 2 minutes before the application of the bacteria culture.

Stock cultures of the following bacteria were prepared: E. Coli, Salmonella-typhimurium, Listeria Monocytogenes, Staphylococcus Aureus and Clostridium Perfringins. These cultures were prepared so as to have approximately 10 million bacteria per milliliter. For application the cultures were diluted by a factor of 5, 50 and 500.

The 2 milliliters of each culture was applied to the surface of the hotdog, covering as much of the surface as

possible. The culture was spread evenly and allowed to dry for 4 hours. At the end of four hours, the hotdogs were coated with the composition of the present invention by spraying so as to be completely covered. The sprayed hotdogs were placed in sterile plastic bags, three to a bag. Control groups of each culture were also prepared. The bags with the Clostridium cultures were vacuum-sealed, all others were closed with only a small amount of air remaining. After closing, the bags were placed in a refrigerator at 40 degrees F. until removed for analysis.

Prior to analysis, the bags were removed from the refrigerator and allowed to come to room temperature. The hot dogs were then rinsed under a stream of cool water to remove the coating composition. No scrubbing was applied. The hot dogs were then placed in 100 ml of sterile buffer prior to plating the buffer. The rinsing procedure was applied to the samples run on day 0 which were not refrigerated.

Table 3 Results:

Day 0

High Level	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
Control					
1	2,760,000	1,300,000	2,760,000	867,000	907,000
2	1,950,000	1,420,000	1,140,000	765,000	973,000
3	2,320,000	1,160,000	2,250,000	843,000	892,000
avg	2,343,333	1,293,333	2,050,000	825,000	924,000
Composition of the present invention					
1	37600	8560	59200	13100	32000
2	41600	7150	53200	11700	25200
3	34100	7320	51400	11900	31000
avg	37767	7677	54600	12233	29400
avg % reduction	98.39	99.41	97.34	98.52	96.82

Day 0

Low Level	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
Control					
1	24,100	12,700	36,200	10,700	12,100
2	20,300	15,200	28,400	11,400	10,600
3	18,300	14,700	31,000	10,100	10,200
avg	20,900	14,200	31,867	10,733	10,967
Composition of the present invention					
1	126	530	592	131	320
2	328	450	532	117	252
3	276	662	514	119	310
avg	243	547	546	122	294
avg % reduction	98.84	96.15	98.29	98.86	97.32

Results:
Day 1

High Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	2,150,000	1,370,000	2,840,000	875,000	657,000
2	2,310,000	1,290,000	2,720,000	732,000	542,000
3	1,820,000	1,520,000	2,430,000	804,000	743,000
avg	2,093,333	1,393,333	2,663,333	803,667	647,333
Composition of the present invention					
1	29500	5780	50400	15200	22500
2	34200	6320	62500	18300	26900
3	25100	7070	50300	12600	19400
avg	29600	6390	54400	15367	22933
avg % reduction	98.59	99.54	97.96	98.09	96.46

Day 1

Low Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	18,300	13,500	33,700	11,800	9,600
2	19,700	14,700	32,900	12,600	7,200
3	16,200	15,900	27,600	9,500	10,400
avg	18,067	14,700	31,400	11,300	9,067
Composition of the present invention					
1	333	576	322	108	156
2	249	423	572	85	182
3	385	486	287	128	295
avg	322	495	394	107	211
avg % reduction	98.22	96.63	98.75	99.05	97.67

Results:

Day 2

High Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	2,830,000	1,720,000	2,790,000	1,020,000	594,000
2	3,140,000	1,420,000	3,040,000	970,000	627,000
3	2,350,000	1,960,000	2,560,000	1,110,000	757,000
avg	2,773,333	1,700,000	2,796,667	1,033,333	659,333
Composition of the present invention					
1	25600	15600	43200	23100	11800
2	22000	17400	50200	19300	15600
3	27200	18200	51500	20700	18200
avg	24933	17067	48300	21033	15200
avg % reduction	99.10	99.00	98.27	97.96	97.69

Day 2

Low Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	16,100	15,600	28,200	14,700	7,200
2	18,800	18,300	31,600	13,300	9,400
3	15,600	14,700	27,200	16,200	8,800
avg	16,833	16,200	29,000	14,733	8,467
Composition of the present invention					
1	293	486	336	87	122
2	268	527	295	152	176
3	367	445	313	98	198
avg	309	486	315	112	165
avg % reduction	98.16	97.00	98.91	99.24	98.05

Results:

Day 4

High Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	3,950,000	1,820,000	2,790,000	1,010,000	702,000
2	3,320,000	2,230,000	3,130,000	1,050,000	657,000
3	2,760,000	2,470,000	2,980,000	1,080,000	602,000
avg	3,343,333	2,173,333	2,966,667	1,046,667	653,667
Composition of the present invention					
1	20800	18800	44700	28000	14100
2	22900	15600	38900	17200	10400
3	23500	12700	40300	13100	6500
avg	22400	15700	41300	19433	10333
avg % reduction	99.33	99.28	98.61	98.14	98.42

Day 4

Low Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	21,300	18,900	26,000	19,400	10,400
2	20,700	13,800	29,600	20,300	8,300
3	18,200	17,200	36,100	22,600	7,800
avg	20,067	16,633	30,567	20,767	8,833
Composition of the present invention					
1	156	336	170	101	113
2	453	367	226	75	124
3	245	408	256	83	206
avg	285	370	217	86	148
avg % reduction	98.58	97.77	99.29	99.58	98.33

Results:

Day 7

High Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	5,640,000	2,070,000	2,990,000	1,420,000	814,000
2	4,360,000	3,210,000	4,720,000	1,250,000	727,000
3	5,250,000	2,670,000	4,230,000	1,320,000	733,000
avg	5,083,333	2,650,000	3,980,000	1,330,000	758,000
Composition of the present invention					
1	34600	12700	33500	13700	10600
2	18200	14300	42600	22400	9600
3	24300	14800	32100	20600	12500
avg	25700	13933	36067	18900	10900
avg % reduction	99.49	99.47	99.09	98.58	98.56

Day 7

Low Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	34,800	22,100	45,600	28,300	7,100
2	38,200	17,800	38,000	16,500	11,400
3	23,200	21,700	42,000	25,700	9,200
avg	32,067	20,533	41,867	23,500	9,233
Composition of the present invention					
1	220	550	143	156	92
2	180	360	192	62	180
3	300	290	243	112	240
avg	233	400	193	110	171
avg % reduction	99.27	98.05	99.54	99.53	98.15

Table 3 Results:

Day 0

High Level	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
Control					
1	2,760,000	1,300,000	2,760,000	867,000	907,000
2	1,950,000	1,420,000	1,140,000	765,000	973,000
3	2,320,000	1,160,000	2,250,000	843,000	892,000
avg	2,343,333	1,293,333	2,050,000	825,000	924,000
Composition of the present invention					
1	37600	8560	59200	13100	32000
2	41600	7150	53200	11700	25200
3	34100	7320	51400	11900	31000
avg	37767	7677	54600	12233	29400
avg % reduction	98.39	99.41	97.34	98.52	96.82

Day 0

Low Level	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
Control					
1	24,100	12,700	36,200	10,700	12,100
2	20,300	15,200	28,400	11,400	10,600
3	18,300	14,700	31,000	10,100	10,200
avg	20,900	14,200	31,867	10,733	10,967
Composition of the present invention					
1	126	530	592	131	320
2	328	450	532	117	252
3	276	662	514	119	310
avg	243	547	546	122	294
avg % reduction	98.84	96.15	98.29	98.86	97.32

Results:
Day 1

High Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	2,150,000	1,370,000	2,840,000	875,000	657,000
2	2,310,000	1,290,000	2,720,000	732,000	542,000
3	1,820,000	1,520,000	2,430,000	804,000	743,000
avg	2,093,333	1,393,333	2,663,333	803,667	647,333
Composition of the present invention					
1	29500	5780	50400	15200	22500
2	34200	6320	62500	18300	26900
3	25100	7070	50300	12600	19400
avg	29600	6390	54400	15367	22933
avg % reduction	98.59	99.54	97.96	98.09	96.46

Day 1

Low Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	18,300	13,500	33,700	11,800	9,600
2	19,700	14,700	32,900	12,600	7,200
3	16,200	15,900	27,600	9,500	10,400
avg	18,067	14,700	31,400	11,300	9,067
Composition of the present invention					
1	333	576	322	108	156
2	249	423	572	85	182
3	385	486	287	128	295
avg	322	495	394	107	211
avg % reduction	98.22	96.63	98.75	99.05	97.67

Results:

Day 2

High Level	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
Control					
1	2,830,000	1,720,000	2,790,000	1,020,000	594,000
2	3,140,000	1,420,000	3,040,000	970,000	627,000
3	2,350,000	1,960,000	2,560,000	1,110,000	757,000
avg	2,773,333	1,700,000	2,796,667	1,033,333	659,333
Composition of the present invention					
1	25600	15600	43200	23100	11800
2	22000	17400	50200	19300	15600
3	27200	18200	51500	20700	18200
avg	24933	17067	48300	21033	15200
avg % reduction	99.10	99.00	98.27	97.96	97.69

Day 2

Low Level	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
Control					
1	16,100	15,600	28,200	14,700	7,200
2	18,800	18,300	31,600	13,300	9,400
3	15,600	14,700	27,200	16,200	8,800
avg	16,833	16,200	29,000	14,733	8,467
Composition of the present invention					
1	293	486	336	87	122
2	268	527	295	152	176
3	367	445	313	98	198
avg	309	486	315	112	165
avg % reduction	98.16	97.00	98.91	99.24	98.05

Results:

Day 4

High Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	3,950,000	1,820,000	2,790,000	1,010,000	702,000
2	3,320,000	2,230,000	3,130,000	1,050,000	657,000
3	2,760,000	2,470,000	2,980,000	1,080,000	602,000
avg	3,343,333	2,173,333	2,966,667	1,046,667	653,667
Composition of the present invention					
1	20800	18800	44700	28000	14100
2	22900	15600	38900	17200	10400
3	23500	12700	40300	13100	6500
avg	22400	15700	41300	19433	10333
avg % reduction	99.33	99.28	98.61	98.14	98.42

Day 4

Low Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	21,300	18,900	26,000	19,400	10,400
2	20,700	13,800	29,600	20,300	8,300
3	18,200	17,200	36,100	22,600	7,800
avg	20,067	16,633	30,567	20,767	8,833
Composition of the present invention					
1	156	336	170	101	113
2	453	367	226	75	124
3	245	408	256	83	206
avg	285	370	217	86	148
avg % reduction	98.58	97.77	99.29	99.58	98.33

Results:

Day 7

High Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	5,640,000	2,070,000	2,990,000	1,420,000	814,000
2	4,360,000	3,210,000	4,720,000	1,250,000	727,000
3	5,250,000	2,670,000	4,230,000	1,320,000	733,000
avg	5,083,333	2,650,000	3,980,000	1,330,000	758,000
Composition of the present invention					
1	34600	12700	33500	13700	10600
2	18200	14300	42600	22400	9600
3	24300	14800	32100	20600	12500
avg	25700	13933	36067	18900	10900
avg % reduction	99.49	99.47	99.09	98.58	98.56

Day 7

Low Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	34,800	22,100	45,600	28,300	7,100
2	38,200	17,800	38,000	16,500	11,400
3	23,200	21,700	42,000	25,700	9,200
avg	32,067	20,533	41,867	23,500	9,233
Composition of the present invention					
1	220	550	143	156	92
2	180	360	192	62	180
3	300	290	243	112	240
avg	233	400	193	110	171
avg % reduction	99.27	98.05	99.54	99.53	98.15

Results:

Day 14

High Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	6,240,000	2,850,000	4,770,000	1,620,000	779,000
2	7,500,000	2,680,000	4,480,000	1,170,000	882,000
3	6,300,000	3,210,000	3,950,000	1,720,000	823,000
avg	6,680,000	2,913,333	4,400,000	1,503,333	828,000
Composition of the present invention					
1	22600	9600	51000	14000	11200
2	28500	8200	28000	12300	8400
3	14600	16700	22100	16300	9500
avg	21900	11500	33700	14200	9700
avg % reduction	99.67	99.61	99.23	99.06	98.83

Day 14

Low Level Control	E. Coli	Salmon.	Listeria	Staph.	Clostrid.
1	55,000	28,000	44,100	33,100	8,400
2	44,000	23,200	46,200	15,000	12,100
3	52,000	29,000	39,000	28,900	7,800
avg	50,333	26,733	43,100	25,667	9,433
Composition of the present invention					
1	160	330	180	130	110
2	183	180	106	87	75
3	254	300	200	65	175
avg	199	270	162	94	120
avg % reduction	99.60	98.99	99.62	99.63	98.73

Example 4

In an examination of Beef and Chicken at Ameritech Laboratories, the analysis requested was a Microbiology Challenge Study of Listeria and E. Coli.

Two pieces of meat, Beef and Chicken, of Uniform thickness (approx. ½") were cut into 1 cm squares, immersed in hot water at 185 deg C. for 2 minutes, and then put in the refrigerator to cool.

The pieces were divided into 4 sets which were handled in the following manner; set 1 - no further treatment, Sets 2, 3 & 4 were immersed in Listeria or E. Coli cultures to coat the pieces with these organisms. Removed, held at room temperature for 6 hours, and then all 4 sets were refrigerated overnight.

The following morning, the samples were removed from the refrigerator. Set #4 was treated with "Composition of the present invention" according to the usual procedure, following which sets 3 and 4 were washed with warm tap water.

All sets of both beef and chicken were then analyzed for bacteria counts.

Table 4 Results:

Beef–Listeria	#1	#2	#3	#4	#4 % reduction (#4/#2) X 100
1	ND	1650000	790000	31600	98.1
2	ND	1470000	720000	11400	99.2
3	ND	1870000	970000	21400	98.9
4	ND	1380000	662000	9500	99.3
5	ND	2060000	1160000	24900	98.8
6	ND	1540000	617000	9900	99.4

* = 100 – ((#4/#2) X 100)
ND = Not detected

Beef-E. Coli	#1	#2	#3	#4	#4 % reduction (#4/#2) X 100
1	ND	2700000	670000	19900	99.3
2	ND	2200000	912000	48200	97.8
3	ND	2940000	574000	35200	98.8
4	ND	2030000	294000	31300	98.5
5	ND	3020000	720000	23100	99.2
6	ND	2570000	454000	12400	99.5

Chicken – Listeria	#1	#2	#3	#4	#4 % reduction (#4/#2) X 100
1	ND	1350000	116000	9500	99.3
2	ND	1660000	362000	8700	99.5
3	ND	1920000	268000	16000	99.2
4	ND	1560000	253000	19400	98.8
5	ND	1620000	147000	12700	99.2
6	ND	1770000	247000	8300	99.5

Chicken – E. Coli	#1	#2	#3	#4	#4 % reduction (#4/#2) X 100
1	ND	2910000	389000	27600	99.1
2	ND	2470000	520000	27500	98.9
3	ND	3120000	374000	22400	99.3
4	ND	3040000	242000	16200	99.5
5	ND	2190000	227000	9500	99.6
6	ND	2570000	462000	12000	99.5

* = 100 – ((#4/#2) X 100)
ND = Not detected

Example 5

The Composition of the present invention was studied as a Surface Cleaner for food preparation surfaces.

The purpose of this study was to determine the effectiveness of Composition of the present invention as a cleaning agent for equipment and structural surfaces.

The following materials were tested using square, smooth, flat surfaces: aluminum, stainless steel, ceramic tile, glass, porcelain and PVC plastic.

Stock cultures of the following bacteria were prepared: E. Coli, Salmonella typimurium, Listeria Monocytogenes and Staphylococcus Aureus. These cultures were prepared so as to have approximately 1 million bacteria per milliliter.

The 2 milliliters of each culture was applied to an area 2 inches square on 9 samples of each surface type. The culture was spread evenly and allowed to dry and then stay overnight.

The nine samples of each surface type were divided into three groups of three. One group was used as the control group. The second and third group were treated with Composition of the present invention by spraying the material on the surface until 100 percent of the test area was covered. One of these sets was allowed to sit for 15 minutes which was followed by a warm water (approximately 45 deg. C) spray rinse. The spray rinse was adjusted so as to have a moderate speed and force. The last set of samples

was treated the same as the second with the exception at the end of the 15 minute waiting period the surface was scrubbed with moderate force with a brush with moderately stiff bristles prior to the water rinse.

At the end of the treatments, all three sets of samples were tested for bacteria counts using the swab technique covering the full 2 square inches.

Table 5 Results:

Stainless Steel	E. Coli	Salmon.	Listeria	Staph.
1	1240000	1720000	986000	1650000
2	1070000	1310000	1320000	1780000
3	1480000	1560000	1080000	1220000
avg	1263333	1530000	1128667	1550000
4	7920	24200	18600	14500
5	4920	7500	1870	24900
6	12180	12100	17400	9720
avg	8340	14600	12623	16373
avg % reduction	99.340	99.046	98.882	98.944
7	36	24	150	104
8	12	103	131	87
9	89	5	22	17
avg	46	44	101	69
avg % reduction	99.996	99.997	99.991	99.996

Aluminum	E. Coli	Salmon.	Listeria	Staph.
1	1042000	1560000	1140000	1820000
2	943000	1720000	1530000	1710000
3	1310000	1840000	1020000	1920000
avg	1098333	1706667	1230000	1816667
4	13500	10500	8430	12700
5	2540	35300	58300	11400
6	11060	18900	11200	6340
avg	9033	21567	25977	10147
avg % reduction	99.178	98.736	97.888	99.441

7	156	0	11	158
8	8	54	5	62
9	67	127	37	19
avg	77	60	18	80
avg % reduction	99.993	99.986	99.999	99.996

Ceramic Tile	E. Coli	Salmon.	Listeria	Staph.
1	1540000	1820000	1190000	1370000
2	1260000	1620000	1070000	1450000
3	1420000	1320000	921000	1620000
avg	1406667	1586667	1060333	1480000
4	4920	64500	24500	9760
5	12750	39400	11430	25600
6	31300	11020	6520	31500
avg	16323	38307	14150	22287
avg % reduction	98.840	97.586	98.666	98.494
7	350	17	27	61
8	56	135	91	30
9	16	45	14	87
avg	141	66	44	39
avg % reduction	99.990	99.996	99.996	99.997

Glass	E. Coli	Salmon.	Listeria	Staph.
1	1250000	1420000	956000	1690000
2	1430000	1670000	1450000	1570000
3	1230000	1750000	1130000	1830000
avg	1303333	1613333	1178667	1696667
4	37800	9700	6650	17900
5	26500	28300	11400	6970
6	19600	16500	33400	12400
avg	27967	18167	17150	12423
avg % reduction	97.854	98.874	98.545	99.268

7	156	0	11	158
8	8	54	5	62
9	67	127	37	19
avg	77	60	18	80
avg % reduction	99.994	99.996	99.999	99.995

Results:

Porcelain	E. Coli	Salmon.	Listeria	Staph.
1	1370000	1360000	1140000	1470000
2	1420000	1310000	1100000	1850000
3	1150000	1620000	1240000	1620000
avg	1313333	1430000	1160000	1646667
4	23700	32400	18200	21300
5	13400	54200	13100	10400
6	10300	15300	7400	8300
avg	15800	33967	12900	13333
avg % reduction	99.797	97.625	98.888	99.190
7	247	47	75	104
8	102	0	14	87
9	65	23	165	17
avg	138	23	85	69
avg % reduction	99.989	99.998	99.993	99.996

PVC Plastic	E. Coli	Salmon.	Listeria	Staph.
1	1570000	1650000	945000	1570000
2	1640000	1320000	894000	1430000
3	1420000	1720000	1160000	1810000
avg	1543333	1563333	999667	1603333
4	7820	23100	16000	16700
5	44400	69500	10400	42000
6	21300	13700	4320	32800

avg	24507	35433	10240	32800
avg % reduction	98.412	97.733	98.976	97.954
7	76	47	56	95
8	6	0	106	16
9	34	82	122	7
avg	39	43	95	39
avg % reduction	99.997	99.997	99.991	99.998

Based on the above results, the composition of the present invention can produce a significant reduction in surface bacteria on the materials studied.

Example 6

In further tests by Associated Analytical Laboratories, Inc. of New York, N.Y. a test was made of a sample of the composition of the present invention as an all natural anti-bacterial Marinade to reduce E. Coli & Salmonella by over 95%

Batch #C99175-3 21:13 - made in Canada

Test: verify claimed effectiveness.

Reference Procedures: Official Methods of Analysis of A.O.A.C. International, 16th Ed, A.O.A.C. method 960.09

Cultures used for Exposure:

Escherichia Coli, ATCC #11229
Salmonella Cholerasuis, ATCC #98-12

Table 6 REPORT OF FINDINGS

	E. Coli	Salmonella
INITIAL BACTERIA COUNT/ml	5.13 x 10ninth	4.49 x 10ninth
BACTERIA COUNT/ml, after 5 minute exposure	1.48 x 10eighth	1.44 x 10eighth
% REDUCTION after 5 minute exposure	97.1150 %	96.7929 %

CULTURES ALLOWED TO AIR DRY @ 35 DEG C. PRIOR TO REEXAMINATION

BACTERIA COUNT/ml after 7 day exposure	7.54 x 10seventh	5.94 x 10seventh
% REDUCTION after 7 day exposure	99.1150 %	98.6771 %
NUMBER CONTROL	5.13 x 10ninth	4.46 x 10ninth
INTERPRETATION:	EFFECTIVE	EFFECTIVE

Example 7

In another test by Associated Analytical Laboratories, Inc. a sample of the composition of the present invention was tested as an all natural anti-bacterial Marinade said to reduce numbers of pathogenic bacteria:

Batch #C99175-3 21:13 - made in Canada

Test: verify claimed effectiveness.

Reference Procedures: Official Methods of Analysis of A.O.A.C. International, 16th Ed, A.O.A.C. method 960.09

Cultures used for Exposure:

STAPHYLOCOCCUS AUREUS, ATCC 6538
CAMPYLOBACTER, JEJUNI, ATCC 33560

Table 7 REPORT OF FINDINGS

	STAPHYLOCOCCUS	CAMPYLOBACTER
INITIAL BACTERIA COUNT/ml	5.03 x 10ninth	3.33 X 10ninth
BACTERIA COUNT/ml, after 5 minute exposure	3.33 x 10eighth	1.08 x 10ninth
% REDUCTION after 5 minute exposure	93.3797 %	67.5676 %

CULTURES ALLOWED TO AIR DRY @ 35 DEG C. PRIOR TO REEXAMINATION

BACTERIA COUNT/ml after 7 day exposure	1.60 x 10ninth	8.87 x 10eighth
% REDUCTION after 7 day exposure	96.8191 %	73.3634 %
NUMBER CONTROL	5.02 x 10ninth	3.32 x 10ninth
INTERPRETATION:	EFFECTIVE @ > 96 %	EFFECTIVE @ > 73 %

Example 8

In yet another test by Associated Analytical Laboratories, Inc., a sample of the composition of the present invention was made as an all natural anti-bacterial Marinade said to reduce numbers of pathogenic bacteria.

Batch #C99175-3 21:13 - made in Canada

Test: verify claimed effectiveness.

Reference Procedures: Official Methods of Analysis of A.O.A.C. International, 16th Ed, A.O.A.C. method 960.09

Cultures used for Exposure:

CLOSTRIDIUM PERFRINGENS, ATCC 3624
YERSINIA ENTEROCOLITICA, ATCC 55075

TABLE 8 REPORT OF FINDINGS

	CLOSTRIDIUM	YERSINIA
INITIAL BACTERIA COUNT/ml	5.26 x 10ninth	3.61 x 10ninth
BACTERIA COUNT/ml, after 5 minute exposure	5.98 x 10eighth	6.20 X 10eighth
% REDUCTION after 5 minute exposure	88.6312 %	82.8255 %

CULTURES ALLOWED TO AIR DRY @ 35 DEG C. PRIOR TO REEXAMINATION

	CLOSTRIDIUM	YERSINIA
BACTERIA COUNT/ml after 7 day exposure	2.944 x 10eighth	4.09 x 10eighth
% REDUCTION after 7 day exposure	94.4106 %	88.6704 %
NUMBER CONTROL	5.25 x 10ninth	3.62 x 10ninth
INTERPRETATION:	EFFECTIVE @ > 94 %	EFFECTIVE @ > 88 %

Example 9

In another example, a test by Assciated Anaylitical Laboratories studied Batch #C99175-3 21:13, which was made in Canada to verify claimed effectiveness against Listeria Monocytogenes, ATCC 4428 and Vibrio Cholerae, ATCC 582.

Reference Procedures: Official Methods of Analysis of A.O.A.C. International, 16th Ed, A.O.A.C. method 960.09

Cultures used for Exposure:

LISTERIA MONOCYTOGENES, ATC 4428
VIBRIO CHOLERAE, ATCC 582

Table 9 REPORT OF FINDINGS

	LISTERIA	VIBRIO
INITIAL BACTERIA COUNT/ml	1.61 x 10ninth	3.98 x 10ninth
BACTERIA COUNT/ml, after 5 minute exposure	4.04 x 10eighth	1.21 X 10ninth
% REDUCTION after 5 minute exposure	74.9068 %	69.5980 %

CULTURES ALLOWED TO AIR DRY @ 35 DEG C. PRIOR TO REEXAMINATION

BACTERIA COUNT/ml after 7 day exposure	6.82 x 10seventh	5.35 x 10eighth
% REDUCTION after 7 day exposure	95.7640 %	88.5578 %
NUMBER CONTROL	1.60 x 10ninth	3.99 x 10ninth
INTERPRETATION:	EFFECTIVE @ > 95 %	EFFECTIVE @ > 88 %

The above results clearly point to the efficacy of the present invention in reducing the bacteria count of food samples treated therewith. The results are properly characterized as consistent and dramatic in reducing bacteria on food to be cooked.

While a preferred embodiment of the invention has been described and shown, it is to be clearly understood that the same is susceptible to numerous changes and modifications apparent to those skilled in the art without departing from the scope of the appended claims.